

REVIEWS

Savannas, barrens and rock outcrop plant communities of North America. Edited by Roger C. Anderson, James S. Fralish, and Jerry M. Baskin. 1999. Cambridge University Press, Cambridge UK. 470 p. Hardcover \$110.00. ISBN 0-521-57322-X.

This book synthesizes information on a number of North American plant community types found in environments that restrict tree and other plant growth due to harsh substrata and or other factors. Why combine savannas with edaphic complexes? I did not find a satisfactory answer to this. I think there is sufficient logic, and material, especially since some additional community types could have been included, for two somewhat smaller books. This would have better served readers who want a less expensive book on either topic, but not both.

Despite this opinion and some other criticisms, I found much to like about this book. It is divided into 26 chapters, each describing an individual community, or in some cases a broad vegetation type (e.g., Southeastern Pine Savannas, Ponderosa Pine and Subarctic Woodlands). Forty-seven leading experts on the subjects selected contribute to create an authoritative treatment. There are three indexes; plant, animal, and topic. The chapters on strongly edaphic or extreme-soil-condition communities comprise the portion of the book that is the most valuable in terms of types that have not previously received enough attention. While information on, for example, Serpentine barrens of Western North America, is readily available (e.g., Kruckeberg's book), it is not for communities such as mid-Appalachian Shale Barrens, Granite Outcrops of the Southeastern United States or Southern Ontario, and especially Niagra Escarpment, Great Lake Alvar (limestone/marble substrata), and Sand Shinnery Oak communities. There is no mention of these in my 1988 edition of *North American Terrestrial Vegetation*, and the authors of the chapter on Sand Shinnery Oak (S. S. Dhillon and M.H. Mills) mention that theirs is the first ever review of the ecology and future conservation of this surprisingly (at least it was to me) extensive community.

To get a sense of how thoroughly community types are treated, note that *North American Terrestrial Vegetation* has seven pages on which Serpentine is mentioned compared to 2 chapters and 29 pages on the topic in this more specialized book. Thus, the book contains much enlightening information, even for ecologists with an encyclopedic level of knowledge of North American vegetation.

Savannas and relatively widespread vegetation types discussed in this book are treated in reviews elsewhere, but not typically with as great an emphasis on conservation and management issues, nor

the effort to integrate plant and animal ecology found throughout this text. Unfortunately, savanna is a nebulous term. As a result there are chapters on vegetation often thought of as woodland (i.e., Pinyon-Juniper) that some might not expect to find. In fact, three chapters use woodland rather than savanna in their title (e.g., Subarctic). Conversely, some savanna or woodland types are left out (e.g., Garry Oak, sub-tropical). There are some edaphic complexes omitted as well, such as, in Western North America, Sierran granite outcrops, and scabland associated with lava flows in the Cascades and on the Modoc Plateau, etc. However, these subjects have been studied relatively little by ecologists and others, there may be insufficient literature from which to prepare a review.

There is not a consistent set of topics covered in each chapter, which is partly understandable considering how different some of the chapter subjects are. For example, while fire is a keystone process maintaining the open tree spacing in many savanna communities, fire effects in rock outcrop and some barrens communities are nil. Nonetheless, there could be greater consistency among chapters. While most authors provided useful, concise summaries, they are missing from 6 chapters. In addition, the use and effectiveness of maps and photos is variable. Some chapters lacked sections on conservation and management despite these being important overall themes.

I was particularly interested in the chapter on California Oak Savanna, as I know more about this vegetation than the other types in the book. The floristic information is less detailed compared to many chapters. Other authors provided species lists, ordinations and/or other summary information, which I liked. This chapter will not serve as a replacement for Jim Griffin's excellent treatment in *Terrestrial Vegetation of California*, at least among more botanically-oriented readers. The Savanna chapter has a range management perspective, and there is considerable detail on this important, practical topic. However, the related, complex subject of oak regeneration is not treated in enough detail. Answers to the cause of apparent failure of blue and valley oaks to regenerate saplings, and even the significance of the apparent failure are multifaceted, and still unclear. But I think more evidence from additional studies that have been undertaken should have been mentioned in the Chapter. For example, the work of K. Danielsen suggesting improved regeneration of Valley Oak with germination in native versus annual grassland, and the extensive regeneration studies performed for the State of California by T. Swieki. It would also have been appropriate to include Garry Oak woodland, even

though it extends well north of California. Finally, I found 3 typo's/mistakes, which makes me wonder how many went unnoticed in other chapters.

I think the most significant contributions of this book are the descriptions of unique, edaphic community types that many vegetation ecologists are unfamiliar with, the integration of plant and animal ecology, and the conservation and management considerations. Compared to typical community descriptions, there is greater discussion of subjects such as endemism, animal interactions, and the widespread management problem of how to determine and achieve an appropriate fire regime. It is interesting and worthwhile to look at these phenomena from the many different aspects and perspectives found in this book.

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Terrestrial ecoregions of North America: A conservation assessment. By Taylor Ricketts, Eric Dinerstein, David Olsen, Colby Loucks et al. 1999. Island Press. Covelo, California. 485 pp.

When I first saw this book my initial feeling was that this was yet another way to classify ecosystems similar to the U.S. Forest Service ECOMAP (Bailey et al. 1994) or Omernik (1995) approach. However, as I probed the pages I found the book was indeed not only an attempt to divide up the continent into ecologically based units, but most importantly, a true analysis of biological and conservation traits using the 116 ecoregions as study units. By defining the ecoregions and having specialists in various taxonomic groups address basic conservation attributes of each ecoregion, the editors have come up with the first uniform treatment for the continent of these principal building blocks of ecological assessment.

Within the last two years this book and The Nature Conservancy's Precious Heritage (Stein et al. 2000) have arrived and addressed similar issues of national/continental scale conservation. Both are valuable additions to the literature. However, Terrestrial Ecoregions of North America is by far the more scholarly and amenable for use as an actual conservation biology tool for the North American Continent. Precious Heritage, with its glossy format and beautifully illustrated examples of the biota, is pitched to the neophyte who needs to be educated on the urgency of conservation needs and on an overall awareness of the biotic distinctiveness of the United States. Terrestrial Ecosystems is a more utilitarian (and less costly) book. The photos of animals and plants are minimal and not particularly

well reproduced. However the numerous multi-color maps of the continent are clean and effective.

One of the greatest attributes of the Terrestrial Ecosystems book is its adherence to the standardized and uniform division of ecoregions. These ecoregions were defined in a systematic way that is well described in the first chapters. The rationale for defining them anew, in lieu of adopting an existing ecoregional classification, is based on the lack of existing uniform treatments for ecoregions covering the full geographic extent of North America. However, adherence to previously defined units where possible is strong, particularly Omernick's (1995). Using the ecoregions, instead of a combination of ecological and political (states, counties) geographic criteria for judging conservation importance, as is the case in Precious Heritage, the book provides a even-handed and readily comperable method of assessing the entire area.

The standardized assessment approach involves a hierarchical division of the continent into realms (3), biogeographical zones (5), 10 major habitat types, and 116 ecoregions. Each of these is given a set of discriminators broken into biological distinctiveness criteria and conservation status criteria. The former include species richness, endemism, rare ecological or evolutionary phenomena, and rare habitat types. The latter include habitat loss, remaining habitat blocks, degree of fragmentation, degree of protection, and future threat. Derived from these criteria are: 1) a biological distinctiveness index, and 2) a conservation status index, which are integrated into five main categories ranging from "globally outstanding ecoregions requiring immediate protection" to "bioregionally and nationally important ecoregions requiring protection of representative habitat blocks and proper management elsewhere for biodiversity conservation." Richness and endemism is analyzed for representative taxa for which sufficient information exists. These include amphibians, birds, butterflies, mammals, vascular plants, reptiles, and land snails. Subdivisions of these major taxonomic groups are also treated including conifers, trees, and tiger beetles. Special features such as subterranean karst biodiversity are also discussed.

The biological assessment elucidates some very interesting facts. Though it is brought out that if politically defined, California leads all other conterminous states in species richness and endemism, the division of the general California area into 12 distinct but relatively small ecoregions has moved the individual ecoregions within or partially within the Golden State into the second tier with respect to several criteria. These include total endemism of all taxa (leaders are the southeastern conifer forests of Florida and adjacent states, and the Colorado Plateau). Bird richness and endemism are lead by southwestern US ecoregions including the Chihua-